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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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EXAMINER

HSU, JONI

ART UNIT

PAPER NUMBER

2628

DATE MAILED: 12/15/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 10/789,248	Applicant(s) DIARD ET AL.	
	Examiner Joni Hsu	Art Unit 2628	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 07 August 2006.
2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-22 is/are pending in the application.
4a) Of the above claim(s) _____ is/are withdrawn from consideration.
5) ☐ Claim(s) _____ is/are allowed.
6) ☒ Claim(s) 1-22 is/are rejected.
7) ☐ Claim(s) _____ is/are objected to.
8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Response to Arguments

1. Applicant's arguments with respect to claims 1-22 have been considered but are moot in view of the new ground(s) of rejection.
2. Applicant's arguments, see pages 6-8, filed August 7, 2006, with respect to the rejection(s) of claim(s) 1, 2, 4-9, and 14-22 under 35 U.S.C. 102(e) and claims 3 and 10-13 under 35 U.S.C. 103(a) have been fully considered and are persuasive. Therefore, the rejection has been withdrawn. However, upon further consideration, a new ground(s) of rejection is made in view of Koga (US006266072B1).
3. Applicant argues that Lee (US006789154B1) does not disclose a bridge that facilitates the activation of a broadcast aperture. The bridge disclosed in Lee does not transmit data to multiple memory locations at the same time. Lee does not disclose any form of simultaneous or broadcast data distribution to multiple devices (pages 6-7).

In reply, the Examiner agrees. However, new grounds of rejection are made in view of Koga.
4. Applicant argues that Sullivan (US 20040181806) does not disclose transferring data between graphics devices via a digital video connection. Rather, Sullivan discloses a method for transmitting a video signal to a display device (page 8).

In reply, the Examiner agrees. However, new grounds of rejection are made in view of Bower (US 20040179007A1).

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

7. Claims 1, 2, 4-9, and 14-22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Lee (US006789154B1) in view of Koga (US006266072B1).

8. Regarding claim 1, Lee et al. **discloses** receiving allocation data for an aperture in a physical address space (...at step 1906, the bridge 1830 receives a request for another specific device attribute. For example, a vendor identifier...or other aperture information can be

requested...for example, the bridge can return a predefined, or calculated, aperture information when the request is for aperture information. For example, during configuration the device needs to provide an indication of memory space to be allocated for its operation for a memory aperture request. Therefore, the bridge 1830 in its response for memory aperture information needs to take into account the memory requirements of both the graphics processors 1840 and 1841...col. 17, lines 45-59, Fig. 18); configuring a bridge (bridge 1830, Fig. 18) with configuration data (...upon receiving a memory aperture request, the bridge 1830 can query each of the graphics processors 1840 and 1841 for their memory aperture information...For example, if each of the graphics processors 1840 and 1841 have a memory aperture size of 16 MB, the bridge 1830 would provide to aperture value 32 MB to the host 1810, thereby providing support for both graphics processors 1840 and 1841...col. 19, lines 60-67; col. 20, lines 1-7, Fig. 18), wherein the bridge (bridge 1830) is adapted to facilitate transferring data between a processor and a plurality of graphics devices (...upon receiving a device type identifier request, the bridge 1830 will provide a device type back consistent with the device type of the graphics processors 1840 and 1841...col. 7, lines 33-36) which shows the data transfer between host 1810 and graphics processors 1840 and 1841; (...For example, during configuration the device needs to provide an indication of memory space to be allocated for its operation for a memory aperture request...col. 17, lines 53-59). Regarding claim limitation wherein configuring a bridge with a first set of configuration data wherein the bridge is adapted to facilitate transferring data between a processor and a plurality of graphics devices; configuring the bridge with a second set of configuration data, thereby activating the aperture, Lee et al. **discloses** in another embodiment of the invention at col. 4, lines 8-21 wherein the bridge (data bridge 110, Fig. 2) receives data,

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which may include graphics processor commands, over the system bus which are similar to first set of configuration data; and then the graphics drive directs graphics data and/or commands to the two graphics processors 120 and 130 which will be activating the aperture, this being a second set of configuration data (...in operation, the data bridge 110 receives data, which may include graphics processor commands, over the system bus...the graphics driver directs graphics data and/or commands to one of the...graphics processors 120 and 130...upon receiving data from the software driver, the data bridge 110 routes the data based upon the destination address...col. 4, lines 8-21).

However, Lee does not teach that the aperture is a broadcast aperture. However, Koga discloses a method of configuring a broadcast aperture (2, Figure 2) for transferring data between a processor (1) and a plurality of graphics devices (10-13), the method comprising receiving allocation data for a broadcast aperture (*CPU 1 assigns a screen area to each of the rendering devices configured. Graphics commands are broadcast to all rendering devices. Upon receipt of a graphics command, each rendering device generates an image in the screen area assigned to the device in question as designated by the received command*, Col. 3, lines 39-45).

It would have been obvious to one of ordinary skill in the art at the time of invention by applicant to modify the device of Lee so that the aperture is a broadcast aperture as suggested by Koga because Koga suggests the advantage of being able to process the graphics data using all of the graphics devices at the same time, which increases the speed of processing (Col. 3, lines 39-49; Col. 1, lines 45-51).

9. Regarding claim 2, Lee et al. **discloses** wherein configuring a bridge with a first set of configuration data further comprises retrieving at least a portion of the first set of configuration data including an aperture size from a system configuration memory (...For example, the bridge can actually map addresses received from the system before being forwarded to the graphics memory...col. 5, lines 55-58) or in other words bridge 110 has determined aperture size from the system (...the configuration 320 indicates that the video memories 140 and 150, associated with the graphics processor 120 and 130 respectively...the memory configuration 320 indicates that the physical address of each of the video memories 140 and 150...col. 5, lines 30-41).

However, Lee does not teach that the aperture is a broadcast aperture. However, Koga discloses that the aperture is a broadcast aperture (2, Figure 2; Col. 3, lines 39-45). This would be obvious for the same reasons given in the rejection for claim 1.

10. Regarding claim 4, Lee et al. **discloses** data bridge 110 receiving data which is provided by a graphics software drive (not shown) which operates on a system level processor; and the graphics driver sends graphics data and/or commands to the graphics processors 120 and 130 (...the data is generally provided by a graphics software driver (not shown), which operates on a system level processor. The graphics driver directs graphics data and/or commands to one of the two graphics processors 120 and 130 by providing destination address information. Therefore, upon receiving data from the software driver, the data bridge 110 routes the data based upon the destination address...col. 4, lines 9-21).

11. Regarding claim 5, Lee et al. **discloses** plurality of graphics devices (graphics processor 120 & 130)(...Fig. 1 illustrates...system portion 100 includes a data bridge 110, a first graphics processor 120, a second graphics processor 130...col. 3, lines 55-62, Fig. 1).

12. Regarding claim 6, Lee et al. **discloses** the first graphics processor 120 and second graphics processor 130 will render image data into their respective memories (...each of the first graphics processor 120 and second graphics processor 130 will render image data into their respective memories 140 and 150...the memories 140 and 150 will be...graphics memories such as used to support frame buffers...col. 4, lines 28-32).

13. Regarding claim 7, Lee et al. **discloses** the viewable area 1610 representing a portion of the display view area 1605 that is rendered by a first graphics device; the viewable area 1615 represents a portion of display view area 1605 that is rendered by a second graphics device (col. 13, lines 18-28, Fig. 16).

14. Regarding claim 8, Lee et al. **discloses** wherein each of the graphics processors render video frames either sequentially or in parallel (col. 10, lines 52-67).

15. Regarding claim 9, Lee et al. **discloses** a display device 1850 being coupled to the graphics processors 1840 and 1841 (col. 15, lines 60-67; col. 16, lines 1-6).

16. Regarding claims 14 and 15, they are similar in scope to claim 1 above and are rejected under the same rationale.

17. Regarding claim 16, Lee et al. **discloses** the data bridge 1410 including Direct Memory Access (DMA) hardware that is programmed by the host to fetch data (col. 11, lines 55-65).

18. Regarding claims 17 and 18, Lee et al. **discloses** base address register for device 120 and 130 (col. 6, lines 1-12); Fig. 4 shows memory accesses being translated through the data bridge 110 (...For example, the bridge can actually map addresses received from the system before being forwarded to the graphics processor...col. 5, lines 42-65, Fig. 4).

19. Regarding claims 19 and 20, Lee et al. **implicitly discloses** storage and retrieval of size value associated with the aperture in that the bridge can query each of the graphics processors 1840 and 1841 for their memory aperture information. By adding up the memory aperture requirements of the multiple devices, a single memory aperture response can be made to the host 1810 (...for example, if each of the graphics processors 1840 and 1841 have a memory aperture size of 16 MB, the bridge 1830 would provide aperture value 32 MB to the host 1810, thereby providing support for both graphics processors 1840 and 1841...col. 19, lines 60-67; col. 20, lines 1-8).

However, Lee does not teach that the aperture is a broadcast aperture. However, Koga discloses that the aperture is a broadcast aperture (Col. 3, lines 39-49). This would be obvious for the same reasons given in the rejection for claim 1.

20. Regarding claim 21, it is similar in scope to claim 17 above and is rejected under the same rationale.

21. Regarding claim 22, it is similar in scope to claim 4 above and is rejected under the same rationale.

22. Claim 3 is rejected under 35 U.S.C. 103(a) as being unpatentable over US 6,789,154 B1 to Lee et al. and Koga (US006266072B1) in view of US 5,790,849 to Crocket et al.

Regarding claim 3, Lee et al. and Koga **do not disclose** wherein the broadcast aperture size is set by a user via a BIOS configuration utility. Crocket et al. **discloses** dynamically resizing a frame buffer aperture in response to a change in resolution or number of color combinations request by a user, an application, or some other source. Crocket et al. further **discloses** changing or setting the aperture size to a value may result in performance enhancement; and a call is made to the system BIOS to set the aperture size that results in efficient graphics processing (...in this case, the user is informed of the need to reboot at functional block 603. At functional block 603, a call is made to the system BIOS routine Set_Aperture_Size_Next_Boot and the desired values are loaded into the battery backed up CMOS from which initialization parameters are derived...col. 7, lines 32-61, Fig. 6). Therefore, it would have been obvious to a person of ordinary skill in the art at the time invention was made to modify the devices as taught by Lee et al. and Koga with the feature “aperture size being set via a BIOS configuration utility” as taught by Crocket et al. **because** it results in efficient

graphics processing by making memory allocation responsive to the system configuration requirements.

23. Claim 10 is rejected under 35 U.S.C. 103(a) as being unpatentable over US 6,789,154 B1 to Lee et al. and Koga (US006266072B1) in view of Bower (US 20040179007A1).

Regarding claim 10, Lee et al. and Koga **do not disclose** wherein the plurality of graphics devices is adapted to transfer rendered image data to the one of the plurality of graphics devices connected with a display device via a digital video connection. However, Bower discloses that the first portion of the plurality of graphics devices (131A-131N, Figure 4) is adapted to transfer rendered image data to one of the plurality of graphics devices (140) connected with a display device (35) via a digital video connection (136A-136N) (*Each rendering node 132A-132N is equipped with a respective graphics device 131A-131N. Graphics devices 131A-131N are communicatively coupled with a compositor 140. Graphics devices 131A-131N are configured to generate and convey viewable and non-viewable data sets to respective frame buffers. The viewable and non-viewable data sets are subsequently dumped to an output interface 136A-136N. Output interfaces 136A-136N are implemented as digital video interface (DVI) outputs. Compositor 140 processes viewable and non-viewable data sets to produce image frames which are then conveyed to a display device 35, [0029]*). Therefore, it would have been obvious to a person of ordinary skill in the art at the time invention was made to modify the connection between graphics devices and display of Lee and Koga by the digital connection interface as taught by Bower **because** the digital interface provides for lossless video data transmission as data remains in digital domain from the point of creation to its consumption.

24. Claims 11-13 are rejected under 35 U.S.C. 103(a) as being unpatentable over US 6,789,154 B1 to Lee et al. and Koga (US006266072B1) in view of US 6,078,339 to Meinerth et al.

25. Regarding claim 11, Lee et al. and Koga **do not disclose** rendered image data being transferred using a blit operation. Meinerth et al. **discloses** plurality of graphic engines including display engine 208; blit engine 220 etc. as per Fig. 2. Further, these multiple graphic devices do not execute simultaneously and provides data coherency where one drawing engine reads an operand that has just been written by another drawing engine (col. 1, lines 55-61; col. 2, lines 30-40). This would then keep image data movement from overloading the graphics bus. Therefore, it would have been obvious to a person of ordinary skill in the art at the time invention was made to modify the devices as taught by Lee et al. and Koga with the blit operations as taught by Meinerth et al. **because** it keeps graphics bus from getting overburdened by excessive data movement thus resulting in efficient image processing.

26. Regarding claims 12 and 13, Lee et al. **does not disclose** rendered image data including an anti-aliased version of at least a portion of a frame or image data being complex portion of a frame. Meinerth et al. **discloses** 3D engines in the 3D pipeline 222 performing various graphics manipulations including depth calculation, color calculation, shade calculation; being able to accept various inputs like colors, textures, transparency and state information. Therefore, it would have been obvious to a person of ordinary skill in the art at the time invention was made

to modify Lee et al. with the "3D processing capabilities that implicitly would include anti-aliasing and complex image data portion of frames" as taught by Meinert **because** it provides for improved graphics performance on a display device.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Joni Hsu whose telephone number is 571-272-7785. The examiner can normally be reached on M-F 8am-5pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Ulka Chauhan can be reached on 571-272-7782. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

JH


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